

REMARKS

Favorable reconsideration of this application is respectfully requested.

Claims 33 and 34 are amended by the present response to now properly depend from claim 20, to address the objections thereto.

Claims 1-34 are pending in this application. Claims 1, 4, 5, 10-15, 21-24, and 27-30 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. patent 6,700,669 to Geng in view of U.S. patent 6,522,787 to Kumar et al. (herein "Kumar"). Claims 2, 3, and 6 were rejected under 35 U.S.C. § 103(a) as unpatentable over Geng in view of Kumar further in view of U.S. patent 4,657,394 to Hallioua. Claim 7-9, 25, and 26 were rejected under 35 U.S.C. § 103(a) as unpatentable over Geng in view of Kumar further in view of Hallioua further in view of U.S. patent 6,640,004 to Katayama et al. (herein "Katayama"). Claims 16, 19, 20, and 31-34 were rejected under 35 U.S.C. § 103(a) as unpatentable over Geng in view of Kumar further in view of Katayama. Claims 17-18 were rejected under 35 U.S.C. § 103(a) as unpatentable over Geng in view of Kumar further in view of Katayama further in view of U.S. patent 6,038,074 to Kitaguchi et al. (herein "Kitaguchi").

Addressing the above-noted prior art rejections, those rejections are traversed by the present response.

Initially, applicants note each of the claims is amended by the present response to clarify features recited therein. Specifically, independent claim 1 now clarifies that taking the picture of an object takes pictures "at at least first and second positions, the second position taking a picture of at least a portion of the object not taken at the first position". The other independent claims are similarly amended.

With reference to Figures 7A-7D in the present specification as a non-limiting example, the claims are directed to a shape measurement system for measuring a three-dimensional shape of an object. According to the claimed invention, pictures of an object are

taken at at least first and second positions. In Figure 7A the first position may be position DB and the second position may be position DC. Taking a picture from position DB in Figure 7A results in generating points as shown in Figure 7B, and taking a picture from position DC in Figure 7A results in generating points as shown in Figure 7C. As shown for example in those Figures, the second position DC takes a picture of the object that includes different portions than as taken at the first point DB. That is, as shown for example in Figures 7B and 7C the points generated by taking the second picture from position DC contains additional points than generated when taking a picture from position DB, although there may be overlapping with the points taken of the picture from position DB.

The claimed invention is directed to a system that can combine the points taken from the at least two different positions into a composite image such as shown in Figure 7D.

Such an operation as discussed above is clarified in the claims and is believed to clearly distinguish over the applied art.

Each of the outstanding rejections cites Geng as the primary reference, but Geng is directed to a significantly different device than in the claimed invention. As shown for example in Figure 11 Geng discloses an operation in which a picture of an object 7 can be taken from two different cameras. However, in that instance each of the cameras is taking pictures of the same surfaces of the object. Geng does not disclose or suggest a structure such as discussed above in Figures 7A-7D in which a first picture is taken from a first viewpoint DB and the second picture is taken from a second viewpoint DC, which do not completely overlap. In Geng both cameras are focused on the same points of the object.

The outstanding Office Action also recognized deficiencies in Geng in not disclosing a picture taking position-specifying part and a correction part including a position sensor. To overcome those recognized deficiencies in Geng the outstanding Office Action cites Kumar.

However, applicants submit such a further combination of teachings is improper as Geng would not utilize any picture taking position-specifying part or position sensor.

In the embodiment of Figure 11 in Geng cited with respect to the claims in the Office Action, Geng fixes two cameras at a specific known distance B separated from one another. Geng utilizes such fixed distances in its calculations. Geng specifically states, "Because the length of the baseline B between the two cameras is known, and the geometrical and optical parameters of two cameras can be obtained from a prior calibration procedure, the locations of a pair of corresponding pixels and a stereo image pair provides sufficient information to determine viewing angles α_1 and α_2 ".¹

In such ways Geng appears to operate on a system with fixed cameras and would not appear to have any reason to determine a position of a camera.

In the claimed invention the position of the camera is detected so that it can be adequately determined what viewpoints the camera is taking an image from. For example in the claimed invention, and again with reference to Figures 7A-7D in the present specification as a non-limiting example, the position of the camera is needed to know the position of the viewpoints DB and DC. Geng has no such need.

Thereby, applicants respectfully submit one of ordinary skill in the art would not have been motivated to modify Geng in the manner suggested in the Office Action to incorporate the noted teachings of Kumar.

Moreover, no teachings in any of the further cited references to Hallioua, Katayama, or Kitaguchi are believed to cure the above-noted deficiencies of Geng in view of Kumar.

In view of the present response applicants respectfully submit the claims as currently written are allowable over the cited art.

¹ Geng at column 7, lines 50-55.

As no other issues are pending in this application, it is respectfully submitted that the present application is now in condition for allowance and it is hereby respectfully requested that this case be passed to issue.

Respectfully submitted,

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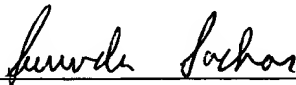
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